

In the Claims

Please amend the claims as follows:

1. (Previously Amended) Water-soluble film which is soluble in water at temperatures between 5 and 35°C comprising at least one polyurethane polymer, which at least one polyurethane polymer comprises:

2 to 35 weight %, based on the weight of polyurethane polymer, of poly(ethylene oxide) groups which have a chain length(s) corresponding to a number average molecular weight within the range of from 300 to 3,000 Daltons;

15 to 150 millequivalents, per 100g of polyurethane polymer, of acid-functional groups; and wherein

at least 50 weight% of the acid-functional groups are neutralised, such neutralisation being with at least one base, at least part of which is at least one non-volatile base;

and said at least one polyurethane polymer is a chain extended product formed using:

(A) a prepolymer component comprising an isocyanate-terminated polyurethane prepolymer, said component being formed from reactants which comprise:

- (i) at least one organic polyisocyanate,
- (ii) at least one isocyanate-reactive compound providing said poly(ethylene oxide) groups in the resulting polyurethane polymer, and
- (iii) at least one isocyanate-reactive compound providing said acid-functional groups in the resulting polyurethane polymer, and

(B) an active hydrogen component comprising at least one active hydrogen chain-extending compound.

2. (Previously Amended) Film according to claim 1 wherein the amount of said poly(ethylene oxide) groups is within the range of 2 to 20 weight % based on the weight of the polyurethane polymer.

3. (Previously Amended) Film according to claim 1 wherein the amount of said poly(ethylene oxide) groups is within the range of 5 to 35 weight % based on the weight of the polyurethane polymer.

4. (Previously Amended) Film according to claim 1 wherein said poly(ethylene oxide) groups have a chain length corresponding to a number average molecular weight within the range of from 500 to 2000 Daltons.

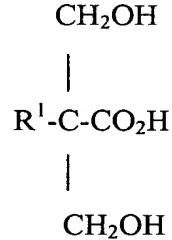
5. (Previously Amended) Film according to claim 1 wherein said poly(ethylene oxide) groups are at least in-chain in the polyurethane polymer.

6. (Previously Amended) Film according to claim 5 wherein the isocyanate-reactive compound providing in-chain poly(ethylene oxide) groups is a poly(ethylene glycol).

7. (Previously Amended) Film according to claim 1 wherein the amount of acid functional groups present in the polyurethane polymer provides 30 to 125 millequivalents of such groups per 100g of polyurethane polymer.

8. (Previously Amended) Film according to claim 1 wherein said acid functional groups are carboxylic acid or sulphonic acid groups.

9. (Previously Amended) Film according to claim 8 wherein the isocyanate-reactive compound providing acid functional groups is a dihydroxyalkanoic acid of formula



where R^1 is hydrogen or alkyl.

10. (Previously Amended) Film according to claim 9 where said isocyanate-reactive compound is 2,2-dimethylol propionic acid (DMPA).

11. (Previously Amended) Film according to claim 8 wherein the isocyanate-reactive compound providing acid functional groups is a diol bearing a sulphonic acid alkali metal salt.

12. (Previously Amended) Film according to claim 1 wherein the reactants for forming the prepolymer component (A) include at least one isocyanate-reactive compound which is monofunctional with regard to isocyanate-reactive functionality and acts as a chain-terminating material for the prepolymer.

13. (Previously Amended) Film according to claim 1 wherein said polyurethane polymer optionally incorporates poly(propylene oxide) groups.

14. (Previously Amended) Film according to claim 1 wherein said active hydrogen component (B) comprises at least one active hydrogen chain-extending compound provided by the reaction of water with said prepolymer.

15. (Previously Amended) Film according to claim 1 wherein said active hydrogen component (B) comprises an added active hydrogen chain-extending compound.

16. (Previously Amended) Film according to claim 15, wherein said added active-hydrogen chain extending compound is selected from the group consisting of a primary or secondary aliphatic, alicyclic, aromatic, araliphatic or heterocyclic polyamine, hydrazine (including its monohydrate) and a substituted hydrazine.

17. (Original) Film according to claim 16 wherein said added active hydrogen chain-extending compound is hydrazine or hydrazine monohydrate.

18. (Previously Amended) Film according to claim 1 wherein at least 90 weight% of the acid functional groups in the polyurethane polymer are neutralised.

19. (Previously Amended) Film according to claim 1 wherein at least 50 weight % of the at least one base used for neutralisation is selected from the group consisting of Group IA monovalent metal bases or basic salts, triethanolamine, 2-methyl-2-amino-1-propanol, and quaternary ammonium hydroxides.

20. (Previously Amended) Film according to claim 19 wherein said base is selected from the group consisting of NaOH, KOH and LiOH.

21. (Original) Film according to either claim 19 or claim 20 wherein the amount of base used provides an excess of base required for the neutralisation of all the acid groups, the amount of excess base remaining after neutralisation being up to 10 weight % based on the weight of the film.

22. (Previously Amended) Film according to claim 1 wherein the polymeric material thereof further comprises at least one other polymer which is other than a polyurethane and does not detract from the water-solubility of the film.

23. (Previously Amended) Film according to claim 22 wherein said at least one other polymer is selected from the group consisting of polyvinyl alcohol and neutralised carboxylic acid - or sulphonic acid-functional vinyl polymer.

24. (Cancelled)

25. (Previously Amended) Aqueous solution of at least one polyurethane polymer which is soluble in water at temperatures between 5 and 35 °C, said at least one polymer comprising:

2 to 35 weight %, based on the weight of polyurethane polymer, of poly(ethylene oxide) groups which have a chain length(s) corresponding to a number average molecular weight within the range of from 300 to 3,000 Daltons;

15 to 150 millequivalents, per 100g of polyurethane polymer, of acid-functional groups; and wherein

at least 50 weight% of the acid-functional groups are neutralised, such neutralisation being with at least one base, at least part of which is at least one non-volatile base;

and said at least one polyurethane polymer is a chain extended product formed using:

- (A) a prepolymer component comprising an isocyanate-terminated polyurethane prepolymer, said component being formed from reactants which comprise:
 - (i) at least one organic polyisocyanate,
 - (ii) at least one isocyanate-reactive compound providing said poly(ethylene oxide) groups in the resulting polyurethane polymer, and
 - (iii) at least one isocyanate-reactive compound providing said acid-functional groups in the resulting polyurethane polymer, and
- (B) an active hydrogen component comprising at least one active hydrogen chain-extending compound.

26. (Cancelled)

27. (Cancelled)

28. (Cancelled)

29. (Cancelled)

30. (Previously Amended) Process for the production of an aqueous polyurethane polymer solution, which polyurethane polymer has:

2 to 35 weight %, based on the weight of polyurethane polymer, of poly(ethylene oxide) groups which have a chain length(s) corresponding to a number average molecular weight within the range of 300 to 3000 Daltons;

15 to 150 milliequivalents, per 100 g of polyurethane polymer, of acid-functional groups; and wherein

at least 50 weight% of the acid-functional groups are neutralised, such neutralisation being with a base(s) at least part of which is a non-volatile base(s);
said process comprising

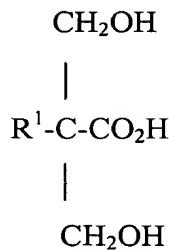
- I. synthesizing a prepolymer component comprising an isocyanate-terminated polyurethane prepolymer from reactants which comprise:
 - (i) at least one organic polyisocyanate
 - (ii) at least one isocyanate-reactive compound providing said poly(ethylene oxide) groups in the resulting polyurethane polymer, and
 - (iii) at least one isocyanate-reactive compound providing said acid-functional groups in the resulting polyurethane polymer;
- II. chain extending said prepolymer component using an active hydrogen component comprising an active hydrogen chain extending compound(s) to form said polyurethane polymer; and
- III. forming an aqueous solution of said polyurethane polymer;

wherein said polyurethane polymer is capable of forming films which are soluble in water at temperatures between 5° and 35° C.

31. (Original) Process according to claim 30 wherein said chain extension step II is carried out simultaneously with the step of forming an aqueous solution of said polyurethane polymer in step III by dispersion of the polyurethane prepolymer into an aqueous medium containing an active hydrogen component and/or in which an active hydrogen component is formed, or into an aqueous medium into which an active hydrogen component is subsequently added.

32. (Original) Process according to either claim 30 or 31 wherein the isocyanate-reactive compound providing poly(ethylene oxide) groups if present in step I is a poly(ethylene glycol).

33. (Previously Amended) Process according to claim 30 wherein the isocyanate-reactive compound providing acid functional groups in step I is a dihydroxyalkanoic acid of formula



where R^1 is hydrogen or alkyl.

34. (Original) Process according to claim 33 where said compound is 2,2-dimethyloproprionic acid (DMPA).

35. (Previously Amended) Process according to claim 30 wherein the isocyanate-reactive compound providing acid functional groups in step I is a diol bearing a sulphonic acid alkali metal salt.

36. (Previously Amended) Process according to claim 30 wherein the reactants for forming the prepolymer component in step I include an isocyanate-reactive compound(s) which is monofunctional with regard to isocyanate-reactive functionality and acts as a chain-terminating material for the prepolymer.

37. (Previously Amended) Process according to claim 30 wherein said active hydrogen component used in step II comprises an active hydrogen chain extending compound(s) provided by the reaction of water with said prepolymer.

38. (Previously Amended) Process according to claim 30 wherein said active hydrogen component used in step II comprises an added active hydrogen chain extending compound.

39. (Previously Amended) Process according to claim 38, wherein said added active hydrogen chain extending compound is a compound selected from the group consisting of a primary or secondary aliphatic, alicyclic, aromatic, araliphatic or heterocyclic polyamine, hydrazine (including its monohydrate) and a substituted hydrazine.

40. (Original) Process according to claim 39 wherein said added active hydrogen chain extending compound is hydrazine or hydrazine monohydrate.

41. (Previously Amended) Process according to claim 40 wherein at least 90 weight% of the acid functional groups in the polyurethane polymer are neutralised.

42. (Previously Amended) Process according to claim 41 wherein at least 50 weight % of the base(s) used for neutralisation is selected from the group consisting of Group IA monovalent metal bases or basic salts, triethanolamine, 2-methyl-2-amino-1-propanol, and quaternary ammonium hydroxides.

43. (Previously Amended) Process according to claim 42 wherein said base is selected from the group consisting of NaOH, KOH, and LiOH.

44. (Original) Process according to either claim 42 or claim 43 wherein the amount of base used provides an excess of base required for neutralisation of all the acid groups, the amount of excess base remaining after neutralisation being up to 10 weight % based on the weight of film formed from the aqueous polyurethane solution.

45. (Previously Amended) Polyurethane polymer which has:

2 to 35 weight %, based on the weight of polyurethane polymer, of poly(ethylene oxide) groups which have a chain length(s) corresponding to a number average molecular weight within the range of from 300 to 3000 Daltons;

15 to 150 milliequivalents, per 100g of polyurethane polymer, of acid-functional groups; and wherein

at least 50 weight% of the acid-functional groups are neutralised, such neutralisation being with a base(s) at least part of which is a non-volatile base(s);
and said polyurethane polymer being a chain extended product formed using:

(A) a prepolymer component comprising an isocyanate-terminated polyurethane prepolymer, said component being formed from reactants which comprise :

- (i) at least one organic polyisocyanate;
- (ii) at least one isocyanate-reactive compound providing said poly(ethylene oxide) groups in the resulting polyurethane polymer; and
- (iii) at least one isocyanate-reactive compound providing said acid-functional groups in the resulting polyurethane polymer, and

(B) an active hydrogen component comprising an active hydrogen chain-extending compound(s);

and, wherein said polyurethane polymer is capable of forming a water-soluble film which is soluble in water at temperatures between 5° and 35° C.

46. (Cancelled)

47. (Previously Added) Film according to claim 9, wherein R¹ is hydrogen or alkyl of 1 to 5 carbon atoms.

48. (Previously added) Process according to claim 33, wherein R¹ is hydrogen or alkyl of 1 to 5 carbon atoms.

49. (Previously Added) A method for packaging a material comprising inserting the material in the water-soluble packaging according to claim 26.

50. (Represented, formerly claim 26) Water-soluble packaging comprising an enveloping film which is soluble in water at temperatures between 5 and 35°C, said enveloping film comprising at least one polyurethane polymer, which at least one polyurethane polymer comprises:

2 to 35 weight %, based on the weight of polyurethane polymer, of poly(ethylene oxide) groups which have a chain length(s) corresponding to a number average molecular weight within the range of from 300 to 3,000 Daltons;

15 to 150 millequivalents, per 100g of polyurethane polymer, of acid-functional groups; and wherein

at least 50 weight% of the acid-functional groups are neutralised, such neutralisation being with at least one base, at least part of which is at least one non-volatile base;

and said at least one polyurethane polymer is a chain extended product formed using:

- (A) a prepolymer component comprising an isocyanate-terminated polyurethane prepolymer, said component being formed from reactants which comprise:
 - (i) at least one organic polyisocyanate,
 - (ii) at least one isocyanate-reactive compound providing said poly(ethylene oxide) groups in the resulting polyurethane polymer, and
 - (iii) at least one isocyanate-reactive compound providing said acid-functional groups in the resulting polyurethane polymer, and
- (B) an active hydrogen component comprising at least one active hydrogen chain-extending compound.

51. (Represented, formerly claim 46) Water-soluble packaging according to claim 50, in the form of a sachet, capsule or bag.

52. (Represented, formerly claim 27) Water-soluble packaging according to claim 50, wherein said enveloping film has a monolayer construction.

53. (Represented, formerly claim 27) Water-soluble packaging according to claim 50, wherein said enveloping film has a laminate construction.

54. (Represented, formerly claim 29) A combination of water-soluble packaging and a material packaged therein, wherein said water-soluble packaging comprises the water-soluble packaging according to claim 50.

55. (Represented, formerly claim 49) A method for packaging a material comprising inserting the material in the water-soluble packaging according to claim 50.